

CLAIMS

What is claimed is:

- 1           1.     A method for measuring a desired condition, comprising:
  - 2           directing a spread spectrum signal into a medium;
  - 3           detecting a parameter that corresponds to the signal directed into the medium;
  - 4           generating a measured parameter signal from the detected parameter; and
  - 5           analyzing the measured parameter signal to determine the desired condition.
- 1           2.     The method of claim 1, wherein the steps of directing a spread spectrum
  - 2           signal into a medium comprises transmitting a spread spectrum current signal into the
  - 3           medium.
- 1           3.     The method of claim 2, wherein the steps of detecting a parameter that
  - 2           corresponds to the signal directed into the medium comprises measuring a voltage
  - 3           signal.
- 1           4.     The method of claim 1, wherein the steps of directing a spread spectrum
  - 2           signal into a medium comprises transmitting a spread spectrum voltage signal into the
  - 3           medium.
- 1           5.     The method of claim 4, wherein the steps of detecting a parameter that
  - 2           corresponds to the signal directed into the medium comprises measuring a current
  - 3           signal.

1           6. The method of claim 1, wherein the steps of generating a measured  
2 parameter signal from the detected parameter comprises generating an impedance  
3 signal.

1           7. The method of claim 6, wherein the steps of analyzing the measured  
2 parameter signal to determine the desired condition comprises analyzing the  
3 impedance signal to determine a contact impedance of a device electrode.

1           8. The method of claim 6, wherein the steps of analyzing the measured  
2 parameter signal to determine the desired condition comprises analyzing the  
3 impedance signal to determine a heart rate of a patient.

1           9. The method of claim 6, wherein the steps of analyzing the measured  
2 parameter signal to determine the desired condition comprises analyzing the  
3 impedance signal to determine a respiration rate of a patient.

1           10. The method of claim 1, wherein the steps of directing a spread spectrum  
2 signal into a medium comprises transmitting a spread spectrum ultrasound signal into  
3 the medium.

1           11. The method of claim 10, wherein the steps of analyzing the measured  
2 parameter signal to determine the desired condition comprises analyzing echoes of the  
3 ultrasound signal to determine the heart rate of a patient.

1           12. The method of claim 1, wherein the steps of directing a spread spectrum  
2 signal into a medium comprises transmitting a spread spectrum light signal into the  
3 medium.

1           13. The method of claim 12, wherein the steps of analyzing the measured  
2 parameter signal to determine the desired condition comprises analyzing detected red  
3 and/or infrared light level to determine the oxygenation level of a patient's blood.

1           14. The method of claim 1, further comprising generating a clock signal that  
2 is used to spread the signal directed into the medium across a desired frequency.

1           15. The method of claim 14, further comprising randomizing the clock  
2 signal.

1           16. The method of claim 15, wherein the clock signal is randomized with a  
2 random number generator and a divider.

1           17. A spread spectrum measurement device, comprising:  
2 means for directing a spread spectrum signal into a medium;  
3 means for detecting a parameter that corresponds to the signal directed into the  
4 medium;  
5 means for generating a measured parameter signal from the detected  
6 parameter; and

7 means for analyzing the measured parameter signal to determine a desired  
8 condition.

1 18. A spread spectrum measurement device at least partially comprised  
2 within a computer readable medium, comprising:  
3 logic configured to direct a spread spectrum signal into a medium;  
4 logic configured to detect a parameter that corresponds to the signal directed  
5 into the medium;  
6 logic configured to generate a measured parameter signal from the detected  
7 parameter; and  
8 logic configured to analyze the measured parameter signal to determine a  
9 desired condition.

1 19. A spread spectrum measurement device, comprising:  
2 a medium interface;  
3 a signal transmitter configured to produce a spread spectrum input signal, the  
4 signal transmitter being in electrical communication with the medium interface;  
5 a signal detector configured to detect a spread spectrum signal at the medium  
6 interface, the signal detector being in electrical communication with the medium  
7 interface; and  
8 a signal processor configured to analyze the spread spectrum signal detected  
9 by the signal detector.

1           20. The device of claim 19, wherein the signal transmitter transmits a spread  
2 spectrum electrical signal.

1           21. The device of claim 19, wherein the signal transmitter transmits a spread  
2 spectrum ultrasound signal.

1           22. The device of claim 19, wherein the signal transmitter transmits a spread  
2 spectrum light signal.

1           23. The device of claim 19, further comprising a random signal generator in  
2 electrical communication with the signal transmitter and the signal detector.